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THE NEWS LETTER

OF THE

BUREAU OF PUBLIC ROADS

VOL. 1, NO. 10

AUGUST, 1926.

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I. C. C. HOLDING HEARINGS ON MOTOR VEHICLE TRAFFIC REGULATION.

THE INTERSTATE COMMERCE COMMISSION IS NOW HOLDING HEARINGS IN VARIOUS POINTS OF THE UNITED STATES RELATIVE TO MOTOR BUS AND TRUCK TRAFFIC REGULATION. THE HEARINGS WERE BROUGHT ABOUT BY A MEASURE INTRODUCED IN THE LAST CONGRESS PROVIDING THAT THE PUBLIC UTILITY OR RAILROAD COMMISSIONS OF THE STATES SHOULD JOINTLY REGULATE INTERSTATE COMMON CARRIER TRAFFIC. THIS MEASURE REQUIRED ALL SUCH CARRIERS TO HAVE CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY. IT PROVIDED THAT IF THE COMMISSIONS OF THE STATES AFFECTED COULD NOT AGREE, OR THERE WAS NO COMMISSION, THE INTERSTATE COMMERCE COMMISSION SHOULD HAVE JURISDICTION AND COULD HOLD HEARINGS AND GRANT CERTIFICATES OF NECESSITY OR LICENSES TO OPERATE. AT PRESENT MANY OF THE STATES HAVE PROVIDED FOR THE REGULATION OF COMMON CARRIER MOTOR VEHICLES ENGAGED IN INTRASTATE COMMERCE BY THE STATE PUBLIC SERVICE COMMISSION OR SIMILAR BODY, AND REQUIRED SUCH COMMON CARRIERS TO OBTAIN A CERTIFICATE OF CONVENIENCE AND NECESSITY. AN INTERSTATE CARRIER OPERATES WITHOUT THIS CERTIFICATE IF ONLY INTERSTATE BUSINESS IS DONE, BUT IF A COMBINATION OF INTERSTATE AND INTRASTATE BUSINESS IS DONE, A CERTIFICATE OF NECESSITY COVERING THE INTRASTATE FEATURE IS REQUIRED.

THE SENATE COMMITTEE ON INTERSTATE COMMERCE VOTED AGAINST THIS MEASURE, AND MANY OF THE REASONS FOR THE DEFEAT ARE LAID TO THE TESTIMONY GIVEN BY THIS BUREAU AS TO THE RELATIVELY SMALL AMOUNT OF THE INTERSTATE COMMON CARRIER BUSINESS.

THE INTERSTATE COMMERCE COMMISSION HAVE SET DATES FOR HEARINGS ON THIS SUBJECT UNDER THEIR DOCKET NO. 18300 AND QUESTIONNAIRES HAVE BEEN SENT TO THE VARIOUS RAILROAD COMPANIES. THESE QUESTIONNAIRES ARE DESIGNED TO DEVELOP FACTS IF POSSIBLE WHICH WILL SHOW THE EFFECT UPON THE RAILROADS OF COMPETITION WITH THE VARIOUS TYPES OF MOTOR VEHICLES. THE DATES OF THE HEARINGS FOLLOW:

CHICAGO, ILLINOIS, JULY 27, 1926, AT 9 A.M., STANDARD TIME, IN THE GREAT NORTHERN HOTEL, BEFORE COMMISSIONER ESCH AND EXAMINER FLYNN.

ST. PAUL, MINNESOTA, JULY 30, 1926, AT 10 A.M., STANDARD TIME, IN THE UNITED STATES COURT ROOMS, BEFORE COMMISSIONER ESCH AND EXAMINER FLYNN.

PORTLAND, OREGON, AUGUST 7, 1926, AT 10 A.M., STANDARD TIME, IN MULTNOMAH COUNTY COURT ROOMS, BEFORE COMMISSIONER AITCHISON AND EXAMINER FLYNN.

SAN FRANCISCO, CALIFORNIA, AUGUST 12, 1926, AT 10 A.M., STANDARD TIME, IN ROOM 237 MERCHANTS EXCHANGE, BEFORE COMMISSIONER AITCHISON AND EXAMINER FLYNN.

LOS ANGELES, CALIFORNIA, AUGUST 17, 1926, AT 10 A.M., STANDARD TIME, IN ROOMS OF THE CALIFORNIA RAILROAD COMMISSION IN THE SUN FINANCE BUILDING, BEFORE EXAMINER FLYNN.

DENVER, COLORADO, AUGUST 25, 1926, AT 10 A.M., STANDARD TIME, IN ROOMS OF THE PUBLIC UTILITIES COMMISSION BEFORE EXAMINER FLYNN.

DETROIT, MICHIGAN, SEPTEMBER 1, 1926, AT 9 A.M., STANDARD TIME, IN THE HOTEL STATLER BEFORE EXAMINER FLYNN.

BOSTON, MASSACHUSETTS, SEPTEMBER 8, 1926, AT 9 A.M., STANDARD TIME, IN THE UNITED STATES COURT ROOMS, BEFORE COMMISSIONER ESCH AND EXAMINER FLYNN.

NEW YORK CITY, SEPTEMBER 10, 1926, AT 9 A.M., STANDARD TIME, IN THE MERCHANTS ASSOCIATION ROOMS, 233 BROADWAY, BEFORE COMMISSIONER ESCH AND EXAMINER FLYNN.

ASHEVILLE, NORTH CAROLINA, SEPTEMBER 15, 1926, AT 11 A.M., STANDARD TIME, IN THE BATTERY PARK HOTEL, BEFORE COMMISSIONER ESCH AND EXAMINER FLYNN.

DALLAS, TEXAS, SEPTEMBER 20, 1926, AT 10 A.M., STANDARD TIME, IN THE JEFFERSON HOTEL, BEFORE EXAMINER FLYNN.

KANSAS CITY, MISSOURI, SEPTEMBER 24, 1926, AT 10 A.M., STANDARD TIME, IN THE CHAMBER OF COMMERCE ROOMS, BEFORE EXAMINER FLYNN.

WASHINGTON, D. C., SEPTEMBER 29, 1926, AT 10 A.M., STANDARD TIME, IN THE OFFICES OF THE COMMISSION, BEFORE COMMISSIONER ESCH AND EXAMINER FLYNN.

IN CONNECTION WITH THESE HEARINGS THE SECRETARY OF AGRICULTURE HAS OFFERED TO PLACE AT THE DISPOSAL OF THE COMMISSION ALL INFORMATION GATHERED BY THE BUREAU IN ITS STUDIES OF HIGHWAY TRANSPORTATION IN CONNECTICUT, PENNSYLVANIA, OHIO, CALIFORNIA, AND COOK COUNTY, ILLINOIS, WHICH TOGETHER REPRESENT THE MOVEMENTS OF SOME 6,000,000 VEHICLES. NO INFORMATION SUPPORTED BY SUCH A MASS OF BASIC EVIDENCE IS AVAILABLE FROM ANY OTHER SOURCE; AND AS THE DEPARTMENT BY VIRTUE OF ITS RESPONSIBILITY WITH RESPECT TO FEDERAL-AID ROADS IS ANXIOUS THAT THE FULL VALUE OF THE SERVICE

The first of these is the fact that the
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WHICH THESE ROADS ARE CAPABLE OF RENDERING MAY BE REALIZED THE SECRETARY HAS TENDERED TO THE COMMISSION ALL INFORMATION IN THE DEPARTMENT'S POSSESSION AND WHATEVER ASSISTANCE WE MAY BE ABLE TO RENDER.

UP TO THIS TIME THE BUREAU HAS BEEN REPRESENTED AT THE HEARING AT CHICAGO BY MR. MACDONALD, DR. MCKAY, AND MR. VOSHELL, AND AT OTHER HEARINGS BY DR. HEWES AND DISTRICT ENGINEERS HATHAWAY, PURCELL, SWEETSER, AND JOHNSON. OUR PRINCIPAL TESTIMONY WILL BE PRESENTED AT THE WASHINGTON HEARING.

THE BUREAU ESPECIALLY DESIRES THAT DISTRICT ENGINEERS FROM THEIR OWN DATA AND OBSERVATIONS AND ALSO THE STATE HIGHWAY DEPARTMENTS SHALL FORWARD TO THE HEADQUARTERS OFFICE ALL INFORMATION WHICH WILL AID IN THE SOLUTION OF THIS PROBLEM. IN THIS CONNECTION THERE ARE CERTAIN STATEMENTS MORE OR LESS FREQUENTLY MADE WITH REFERENCE TO HIGHWAY TRANSPORT THAT HAVE RECENTLY BECOME MORE IMPORTANT BECAUSE OF THEIR POSSIBLE BEARING ON THE PUBLIC ATTITUDE TOWARD THE QUESTION OF COMPETITION OF THE MOTOR BUS AND MOTOR TRUCK WITH THE RAILROADS ON WHICH THE INTERSTATE COMMERCE COMMISSION IS NOW TAKING EVIDENCE. BECAUSE OF THE HEARINGS HELD BY THE INTERSTATE COMMERCE COMMISSION THE WHOLE QUESTION OF THE RELATIONS BETWEEN THE RAILWAYS AND THE HIGHWAYS IS RECEIVING MORE THAN ORDINARY PUBLIC ATTENTION. CERTAIN CONCEPTIONS WITH REFERENCE TO IT EXIST WHICH HAVE BEEN PROMOTED BY STATEMENT OF OPINIONS WITHOUT EXAMINATION AS TO THE ADEQUACY OF THEIR FOUNDATION. AMONG THESE MAY BE STATED THE FOLLOWING:

1. THE MOTOR TRUCKS ARE POUNDING TO PIECES THE HIGHWAYS.
2. MOTOR TRUCKS AND MOTOR BUSES ARE RUNNING OVER HIGHWAYS BUILT AND PAID FOR BY THE PUBLIC WHILE THE RAILROADS ARE REQUIRED TO BUILD AND MAINTAIN THEIR OWN TRACKS.
3. MOTOR BUS AND MOTOR TRUCK HAVE BECOME COMPETITORS OF THE RAILWAYS BECAUSE OF THE ADVANTAGE OF FREE HIGHWAYS.
4. THE MOTOR BUS IS TAKING AWAY FROM THE RAILROADS THEIR PASSENGER TRAFFIC.
5. THE MOTOR TRUCK IS TAKING AWAY FROM THE RAILROADS THEIR FREIGHT TRAFFIC.
6. THE MOTOR TRUCK AND MOTOR BUS CAN NOT OPERATE ON A DEPENDABLE OR UNINTERRUPTED SCHEDULE THROUGH THE YEAR AND THE RAILROADS ARE FORCED TO SERVE WHEN CONDITIONS ARE MOST DIFFICULT AND OPERATING COSTS THE HIGHEST.

IN SOME SUCH FORM THESE AND OTHER CRITICISMS ARE MADE OF HIGHWAY TRANSPORT. ALSO MUCH USE HAS BEEN MADE OF SPECIFIC CASES LIMITED IN EXTENT TO PROVE THE EXISTENCE OF A GENERAL UNFAVORABLE CONDITION OR TO SUPPORT THE NECESSITY FOR STATE OR FEDERAL REGULATORY LEGISLATION. AT THE PRESENT TIME FACTS OF BROAD APPLICATION ARE NEEDED. THE SO-CALLED COMPETITION BETWEEN RAILWAYS AND HIGHWAYS NOW EXISTING IS LARGELY A TRANSFER OF SPECIFIC

SERVICES BETWEEN TRANSPORTATION AGENCIES. THE MEASURE OF THIS TRANSFER BETWEEN TRANSPORTATION AGENCIES IS DIFFICULT TO DETERMINE AS A TOTAL BECAUSE OF THE TREMENDOUS NUMBER OF MOTOR VEHICLES IN OPERATION AND THE DIFFERING LOCAL CONDITIONS. THE IMMEDIATE QUESTION, HOWEVER, NOW UNDER SCRUTINY, IS FEDERAL VS. STATE REGULATION, AND THIS ASPECT IS STILL FURTHER LIMITED TO THE MOTOR VEHICLE COMMON CARRIER AND PARTICULARLY THE INTERSTATE COMMON CARRIER HIGHWAY TRANSPORT.

ONE OF THE FUNDAMENTAL DIFFERENCES BETWEEN RAIL TRANSPORTATION AND HIGHWAY TRANSPORTATION IS THE FACT THAT THE PUBLIC DIRECTLY PROVIDES THE HIGHWAYS, MAINTAINS THEM AND REGULATES THE TRAFFIC OVER THEM. IT IS OF IMPORTANCE, THEREFORE, THAT STATE AND FEDERAL HIGHWAY OFFICIALS BE ABLE TO ANSWER THE QUESTIONS AS TO THE ADDITIONAL COSTS OF HIGHWAY CONSTRUCTION AND MAINTENANCE WHICH ARE DIRECTLY THE RESULT OF THE COMMON CARRIER MOTOR TRUCK AND MOTOR BUS TRAFFIC, AND OF THIS ITEM THE PERCENTAGE TRACEABLE TO THE INTERSTATE CARRIER.

THERE ARE NOW ON THE HIGHWAYS THE FOLLOWING TYPES OF TRAFFIC:

1. PRIVATE AUTOMOBILES, INTRASTATE.
2. PRIVATE AUTOMOBILES, INTERSTATE.
3. PRIVATE BUS TRAFFIC, INTRASTATE.*
4. PRIVATE BUS TRAFFIC, INTERSTATE.
5. PRIVATE MOTOR TRUCK, INTRASTATE.
6. PRIVATE MOTOR TRUCK, INTERSTATE.
7. TRUCKS OPERATING UNDER CONTRACT, INTRASTATE.
8. TRUCKS OPERATING UNDER CONTRACT, INTERSTATE.
9. COMMON CARRIER MOTOR TRUCKS, INTRASTATE.
10. COMMON CARRIER MOTOR TRUCKS, INTERSTATE.
11. COMMON CARRIER MOTOR BUSES, INTRASTATE.
12. COMMON CARRIER MOTOR BUSES, INTERSTATE.

THIS CLASSIFICATION IS FOR TRAFFIC AND NOT FOR VEHICLES AS THE SAME VEHICLES MAY ENGAGE IN MORE THAN ONE TYPE OF TRAFFIC. IT IS NOW OF IMPORTANCE TO ESTIMATE THE RELATIVE PROPORTIONS OF THE EXPENDITURES FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS THAT MAY PROPERLY BE CHARGED TO EACH TYPE OF TRAFFIC.

MORE SPECIFICALLY:

(1) HAVE THE COMMON CARRIER MOTOR VEHICLES ADDED TO THE COST OF CONSTRUCTING AND MAINTAINING HIGHWAYS ADEQUATE FOR THE PRIVATELY OWNED MOTOR VEHICLE?

* SUCH AS SCHOOL BUSES, PUBLIC IN OWNERSHIP BUT PRIVATE IN THE SENSE THEY ARE NOT OPEN FOR HIRE BY THE PUBLIC.

(2) IS THE MOTOR VEHICLE IN GENERAL FEEDING OR
COMPETING WITH THE STEAM AND ELECTRIC RAILWAYS?

(3) WHAT SPECIFIC EXAMPLES OF RAILROADS USING THE
HIGHWAYS TO SUPPLEMENT THEIR OWN OPERATIONS?

(4) EXAMPLES OF COMPETITION BETWEEN THE RAILWAYS
AND THE HIGHWAYS.

THE ABOVE ARE INDICATIVE ONLY OF THE CHARACTER OF FACTS
THE BUREAU IS GATHERING. ANY DEFINITE INFORMATION WHICH THE
DISTRICT ENGINEERS OR THE STATE HIGHWAY DEPARTMENTS HAVE GATHERED
WILL BE MOST ACCEPTABLE OR ADVICE AS TO THE POSSIBILITY OF OBTAIN-
ING DEFINITE FACTS BEARING UPON THIS SITUATION.

BUREAU OF PUBLIC ROADS

STATUS OF FEDERAL AID ROAD CONSTRUCTION FUNDS

AS OF JULY 31, 1926

S. P. R. - F. A. - A. -
M. - JULY 31, 1926

STATES	1	2		3		4	5		6				STATES				
		APPORTIONMENT TO PROJECTS FROM JULY 1, 1916 TO DATE		ALLOTTED TO PROJECTS (SEE COLUMN 6 FOR DETAILS)			PAID TO STATES		BALANCE OF APPORTIONMENTS		(SUBDIVISION OF AMOUNTS SHOWN IN COLUMN 2)						
											COMPLETED AND PAID			AGREEMENT STAGE		P. S. & E. STAGE RECOMMENDED BY DISTRICT ENGINEER	
		FEDERAL AID	MILES	FEDERAL AID	MILES		FEDERAL AID	MILES	NOT ALLOTTED TO PROJECTS (COLUMN 1-2)	NOT YET PLACED UNDER CONSTRUCTION (COLUMN 1-3)	FEDERAL AID	MILES		FEDERAL AID	MILES	FEDERAL AID	MILES
ALABAMA	\$ 14,349,455.00	1,516.9	\$ 11,198,719.52	1,505.4	\$ 10,096,196.29	\$ 3,160,736.48	\$ 3,265,167.75	\$ 9,218,901.44	1,374.0	\$ 1,661,484.51	\$ 308,335.57	\$ 308,335.57	27.6	ALABAMA			
ARIZONA	9,617,249.00	837.6	7,045,660.15	811.2	6,289,140.19	2,571,586.86	2,609,104.38	5,863,772.35	759.8	947,904.29	233,903.51	233,903.51	14.4	ARIZONA			
ARKANSAS	11,606,804.00	1,686.7	10,260,676.62	1,631.8	9,212,332.94	1,945,171.38	1,633,454.14	7,666,231.36	1,358.1	2,240,943.50	323,501.76	323,501.76	53.2	ARKANSAS			
CALIFORNIA	22,072,815.00	1,372.9	18,904,380.33	1,378.3	16,392,424.13	3,169,434.17	3,279,107.58	13,003,592.30	1,059.0	\$ 1,167,762.37	284.3	740,025.16	36.5	CALIFORNIA			
COLORADO	12,325,812.00	995.8	9,697,319.25	960.7	8,251,303.53	2,628,492.75	2,969,615.09	7,363,403.53	763.2	1,759,294.72	201.6	574,391.00	41.1	COLORADO			
CONNECTICUT	4,333,681.00	180.5	3,447,676.08	171.7	2,352,862.75	886,005.92	1,213,527.17	2,100,686.90	117.1	1,142,782.31	58.0	264,205.37	5.4	CONNECTICUT			
DELAWARE	2,474,058.00	168.2	2,470,654.40	162.5	2,252,243.50	1,670,112.96	221,914.50	1,791,665.60	124.3	582,829.50	35.4	106,093.30	2.5	DELAWARE			
FLORIDA	6,514,841.04	412.7	6,514,841.04	412.7	5,086,454.52	1,670,112.96	1,689,911.21	2,032,694.73	153.8	4,362,413.06	25.9	113,765.25	2.0	FLORIDA			
GEORGIA	18,431,953.00	2,473.4	17,767,775.47	2,454.9	15,736,801.55	106,892.02	654,177.53	11,938,771.61	1,824.6	5,825,973.21	632.6	567,315.16	22.0	GEORGIA			
IOWA	8,563,627.00	977.7	7,676,114.31	887.4	6,744,513.12	267,038.02	883,512.69	6,012,777.08	731.5	1,117,831.64	107.9	1,151,997.26	130.3	IOWA			
ILLINOIS	29,842,136.00	1,659.2	24,489,635.85	1,626.4	22,758,187.45	5,343,533.16	5,722,333.38	21,600,956.40	1,440.8	1,547,179.52	138.0	1,343,503.51	93.4	ILLINOIS			
INDIANA	16,204,355.00	1,088.3	17,181,341.95	1,081.1	13,670,698.88	882,454.21	1,023,013.06	8,467,822.45	552.7	7,309,183.95	420.3	1,543,634.33	116.3	INDIANA			
IOWA	19,485,653.00	2,372.6	17,343,902.81	2,830.2	13,819,384.51	639,531.98	2,141,760.19	11,992,340.77	2,124.7	5,427,658.75	742.2	1,366,031.49	106.7	IOWA			
KANSAS	13,464,411.00	1,984.6	17,437,435.88	1,851.6	14,821,215.61	1,356,763.12	2,026,374.12	12,732,833.32	1,300.2	3,642,934.67	515.3	1,672,234.89	268.4	KANSAS			
KENTUCKY	13,212,803.00	1,061.7	11,267,475.03	1,059.1	10,039,585.28	1,897,632.31	1,945,333.97	8,598,462.08	764.6	2,578,640.15	263.4	1,381,107.46	27.7	KENTUCKY			
LOUISIANA	9,272,408.00	1,254.7	7,917,442.15	1,217.1	7,066,078.00	940,962.72	1,454,965.85	6,144,739.89	1,055.9	1,605,159.11	141.4	572,537.18	49.4	LOUISIANA			
MAINE	6,464,828.00	420.9	5,047,356.63	370.9	4,506,120.58	810,403.39	1,417,471.37	4,132,507.30	303.6	1,266,153.22	39.6	195,764.20	17.7	MAINE			
MARYLAND	6,925,057.00	511.7	5,365,534.55	454.1	5,146,036.97	20,501.49	559,427.35	5,112,391.22	423.3	260,030.93	29.7	531,533.30	51.7	MARYLAND			
MASSACHUSETTS	10,108,726.00	450.1	7,886,922.94	435.6	6,794,128.62	1,974,294.51	2,291,803.06	6,657,260.52	374.5	1,137,614.84	51.9	333,676.03	13.7	MASSACHUSETTS			
MICHIGAN	20,342,365.00	1,277.0	17,115,102.93	1,265.8	14,877,680.12	3,227,262.07	3,309,889.57	11,930,659.26	370.5	4,113,913.91	213.3	1,065,930.75	93.1	MICHIGAN			
MINNESOTA	13,591,780.00	3,794.2	13,317,976.63	3,773.1	17,060,005.30	242,804.37	273,804.37	15,886,475.53	3,248.8	2,518,090.00	508.4	944,550.00	27.0	MINNESOTA			
MISSISSIPPI	12,128,016.00	1,596.2	10,918,322.73	1,615.2	9,245,122.97	425,187.73	1,203,625.27	7,455,153.10	1,135.3	3,035,065.17	370.0	1,212,609.00	140.3	MISSISSIPPI			
MISSOURI	22,786,438.00	2,130.0	21,920,026.95	2,110.7	17,243,369.36	400,670.56	866,409.05	14,113,113.83	1,563.9	7,274,543.68	493.8	987,207.87	61.2	MISSOURI			
MONTANA	13,424,895.00	1,337.2	7,531,850.23	1,197.7	6,995,055.30	4,539,810.64	5,833,034.77	6,393,554.15	1,056.9	2,339,277.44	267.2	99,243.76	13.1	MONTANA			
NEBRASKA	14,635,235.00	3,275.0	12,694,713.02	3,149.6	12,080,812.71	1,940,621.98	2,554,422.32	6,592,430.58	1,793.6	6,261,034.21	1307.5	911,136.13	184.9	NEBRASKA			
NEVADA	7,735,215.00	927.7	8,110,043.86	927.7	7,335,348.88	685,165.15	696,509.37	5,795,505.76	603.9	2,193,352.62	281.0	191,791.43	47.9	NEVADA			
NEW HAMPSHIRE	3,159,482.00	276.3	2,907,918.41	266.3	2,481,613.23	171,973.69	354,506.16	2,377,450.07	237.6	411,933.17	21.2	208,475.17	11.6	NEW HAMPSHIRE			
NEW JERSEY	8,467,420.00	353.8	8,096,704.64	325.1	6,774,689.41	370,715.36	801,875.36	5,161,827.97	794.3	2,370,246.67	21.9	564,630.00	37.6	NEW JERSEY			
NEW MEXICO	10,972,396.00	1,592.5	9,972,271.15	1,527.4	7,874,860.33	2,000,114.84	2,661,723.74	7,339,657.36	1,477.0	807,595.33	98.8	825,013.45	66.8	NEW MEXICO			
NEW YORK	34,045,195.00	1,913.2	29,303,194.67	1,779.8	27,121,634.57	4,742,010.43	6,923,560.43	18,399,731.87	1,225.9	10,399,652.70	656.9	513,900.00	30.4	NEW YORK			
NORTH CAROLINA	15,717,206.00	1,474.1	14,973,923.82	1,448.0	14,662,120.07	737,276.18	1,055,095.93	11,177,337.94	1,257.9	3,220,191.51	174.4	582,410.37	41.8	NORTH CAROLINA			
NORTH DAKOTA	10,748,659.00	3,359.1	9,200,176.78	3,081.2	6,982,850.43	46,089.09	1,548,482.22	6,048,391.45	2,193.1	3,071,269.38	684.7	1,592,211.07	482.3	NORTH DAKOTA			
OHIO	25,731,756.00	1,836.9	23,405,475.82	1,726.5	21,978,443.48	2,326,313.18	3,763,352.52	17,659,653.01	1,389.6	4,050,325.73	317.2	1,725,498.08	130.1	OHIO			
OKLAHOMA	15,063,787.00	1,347.5	14,932,690.16	1,276.3	14,514,110.35	1,127,096.84	1,545,676.65	13,179,232.93	1,184.1	1,286,433.87	134.2	467,023.36	29.2	OKLAHOMA			
OREGON	10,873,547.00	1,087.6	10,642,117.67	1,065.5	9,573,539.81	237,279.33	2,452,292.42	8,654,146.37	945.1	1,987,766.52	179.5	100,704.79	13.2	OREGON			
PENNSYLVANIA	31,336,781.00	1,766.8	29,613,397.64	1,718.4	26,427,918.37	1,516,793.36	2,452,292.42	21,560,732.04	1,188.8	7,779,957.40	580.5	490,308.11	37.5	PENNSYLVANIA			
RHODE ISLAND	2,667,569.00	123.5	2,110,349.06	115.2	1,558,829.06	557,219.94	681,584.94	1,558,829.06	86.7	551,590.00	36.8	415,877.28	33.7	RHODE ISLAND			
SOUTH CAROLINA	9,801,524.00	1,741.5	9,788,821.94	1,725.2	8,386,491.42	12,702.06	1,623.64	6,919,025.60	1,616.6	2,453,919.06	191.2	227,535.86	70.3	SOUTH CAROLINA			
SOUTH DAKOTA	11,166,790.00	2,951.6	10,810,322.89	2,851.9	10,540,770.43	356,467.11	626,019.67	8,734,461.68	2,248.2	1,848,335.35	633.1	227,535.86	70.3	SOUTH DAKOTA			
TEXAS	15,280,591.00	1,052.9	13,850,263.07	1,033.9	12,263,682.57	912,127.81	1,430,337.53	10,276,584.02	780.0	3,654,911.60	248.4	427,067.57	24.5	TEXAS			
UTAH	40,606,431.00	5,894.3	37,029,675.86	5,827.6	31,715,133.56	3,576,755.16	4,911,717.68	27,694,460.19	4,968.1	7,451,267.07	842.8	1,984,133.59	83.4	UTAH			
VERMONT	7,818,779.00	757.2	7,036,273.29	700.4	6,061,214.44	782,506.71	1,429,049.53	5,098,460.68	586.4	1,352,059.57	167.3	576,773.04	43.5	VERMONT			
VIRGINIA	3,268,507.00	173.6	2,782,234.90	170.6	2,206,386.60	444,535.63	486,272.10	2,017,639.51	134.6	745,011.63	36.2	61,260.23	2.8	VIRGINIA			
WASHINGTON	13,501,574.00	1,209.5	13,139,460.32	1,190.7	11,477,559.77	266,934.83	302,053.68	10,662,088.45	1,015.7	2,640,301.24	173.3	251,893.48	20.5	WASHINGTON			
WEST VIRGINIA	10,145,776.00	760.0	9,436,509.46	709.6	8,387,909.15	566,266.54	709,266.54	7,782,909.46	668.6	2,067,600.00	86.4	33,000.00	5.0	WEST VIRGINIA			
WEST VIRGINIA	7,352,611.00	692.8	6,204,448.73	630.0	5,509,676.09	333,822.65	1,148,062.27	4,334,759.06	405.3	1,941,427.85	133.7	682,501.44	53.8	WEST VIRGINIA			
WISCONSIN	17,438,815.00	2,007.8	14,189,290.35	1,950.0	11,317,293.95	2,866,561.65	3,249,294.66	10,392,705.73	1,592.1	2,738,613.19	256.1	1,452,036.43	159.6	WISCONSIN			
WYOMING	8,566,274.00	1,419.6	7,973,502.88	1,370.9	7,304,762.91	582,771.12	743,113.93	6,259,076.05	1,181.5	1,446,762.02	156.0	267,664.81	82.1	WYOMING			
HAWAII	1,100,153.00	16.9	312,835.18	15.9	76,027.07	767,617.82	767,617.82	10,276,584.02	780.0	3,654,911.60	248.4	427,067.57	24.5	HAWAII			
TOTALS	\$ 671,376,000.00	70,087.8	\$ 581,147,214.69	57,824.8													

DELEGATES APPOINTED TO THE FIFTH INTERNATIONAL ROAD CONGRESS

OFFICIAL DELEGATES OF THE UNITED STATES GOVERNMENT HAVE BEEN APPOINTED TO ATTEND THE FIFTH INTERNATIONAL ROAD CONGRESS WHICH OPENS AT MILAN, ITALY, ON SEPTEMBER 6. THIS IS THE FIRST OF THE CONGRESSES IN WHICH THIS NATION HAS BEEN OFFICIALLY REPRESENTED. ACCEPTANCE OF MEMBERSHIP IN THE PERMANENT ASSOCIATION OF INTERNATIONAL ROAD CONGRESSES AND AUTHORIZATION FOR THE APPROPRIATION OF THE EXPENSES OF DELEGATES TO THE CURRENT MEETING WAS PROVIDED BY CONGRESS DURING THE CLOSING DAYS OF THE LAST SESSION IN SENATE RESOLUTION 62, WHICH WAS SIGNED BY THE PRESIDENT ON JUNE 18.

ACTIONING ON THE JOINT RECOMMENDATION OF THE SECRETARIES OF STATE, AGRICULTURE, AND COMMERCE THE PRESIDENT HAS APPOINTED AS OFFICIAL DELEGATES TO THE CONGRESS: THOMAS H. MACDONALD, CHIEF OF THE BUREAU OF PUBLIC ROADS; PAUL D. SARGENT, CHIEF ENGINEER OF THE MAINE STATE HIGHWAY COMMISSION; JOHN N. MACKALL, CHAIRMAN OF THE MARYLAND STATE ROADS COMMISSION; H. C. MACLEAN, COMMERCIAL ATTACHE OF THE DEPARTMENT OF COMMERCE AT ROME; H. H. KELLY, ASSISTANT TRADE COMMISSIONER OF THE DEPARTMENT OF COMMERCE AT PARIS; H. H. RICE AND PYKE JOHNSON OF THE NATIONAL AUTOMOBILE CHAMBER OF COMMERCE.

THE DELEGATES WILL SAIL FROM NEW YORK ON THE STEAMSHIP PRESIDENT HARDING, LEAVING AUGUST 25 AND WILL ARRIVE AT MILAN IN TIME TO TAKE PART IN ALL MEETINGS OF THE CONGRESS WHICH WILL BE OPENED ON SEPTEMBER 6 AND CONTINUE AT MILAN FOR SIX DAYS, CLOSING IN ROME ON THE FOLLOWING DAY, SEPTEMBER 13.

SIMULTANEOUSLY WITH THE CONGRESS AN INTERNATIONAL ROAD EXHIBITION WILL BE HELD, UNDER THE PATRONAGE OF THE COMMUNAL AND PROVINCIAL ADMINISTRATIONS AND THE CHAMBER OF COMMERCE OF MILAN, IN THE FIERA CAMPIONARIA. THE EXHIBITION WILL OPEN ON THE FIRST AND CONTINUE UNTIL THE TWENTIETH OF SEPTEMBER.

THE UNITED STATES OF AMERICA

BEFORE ME, the undersigned authority, on this day personally appeared _____, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this _____ day of _____, 19____.

IN WITNESS WHEREOF, I have hereunto set my hand and seal of office this _____ day of _____, 19____.

Notary Public in and for the State of _____

DISTRIBUTION OF SURPLUS WAR MATERIAL COMPLETED BY THE BUREAU

CONTRIBUTED BY C. D. CURTISS,
ASSISTANT TO THE CHIEF OF THE BUREAU.

THE ALLOTMENT OF ALL SURPLUS WAR MATERIAL THUS FAR MADE AVAILABLE HAS BEEN COMPLETED AND THE FIELD OPERATIONS OF THE BUREAU HAVE BEEN DISCONTINUED. IT IS NOT BELIEVED THAT MATERIAL OF SUFFICIENT VALUE TO WARRANT DISTRIBUTION, WILL BECOME AVAILABLE IN THE FUTURE.

ORDERS FOR PYROTOL MAY BE PLACED AS USUAL. IT IS ESTIMATED THAT THE SUPPLY OF THIS MATERIAL WILL LAST UNTIL THE CLOSE OF THE CALENDAR YEAR 1927.

THE BUREAU WILL BE GLAD TO CONTINUE HANDLING FOR A TIME THE "RESHIPMENT CIRCULARS" WHICH PROVIDE FOR THE REALLOTMENT OF SUCH SURPLUS MATERIALS AS HAVE BEEN ALLOTTED TO ANY STATE AND LATER HAVE BEEN FOUND TO BE IN EXCESS OF THE NEEDS.

THE FINAL BILLS COVERING HANDLING CHARGES WILL BE MAILED OUT SOON. PROMPT PAYMENT OF THESE AND ANY OLD UNPAID ACCOUNTS WILL BE APPRECIATED SINCE THE BUREAU IS ANXIOUS TO CLOSE THESE RECORDS AS SOON AS POSSIBLE.

IN ADVISING THE STATE HIGHWAY DEPARTMENTS OF THE COMPLETION OF THIS WORK, MR. MACDONALD IN A RECENT LETTER EXPRESSED HIS APPRECIATION OF THEIR SPLENDID COOPERATION IN CARRYING FORWARD THE DISTRIBUTION.

HENRY R. TRUMBOWER ACCEPTS CHAIR AT THE UNIVERSITY OF WISCONSIN

HENRY R. TRUMBOWER, SENIOR AGRICULTURAL TRANSPORTATION ECONOMIST OF THE BUREAU WILL RESIGN ON SEPTEMBER 1 TO ACCEPT THE CHAIR OF PROFESSOR OF TRANSPORTATION AT THE UNIVERSITY OF WISCONSIN. HIS WORK THERE WILL INCLUDE LECTURES AND INSTRUCTION IN THE EXISTING COURSES ON RAILROAD TRANSPORTATION AND THE DEVELOPMENT OF A HIGHWAY TRANSPORT CURRICULUM.

MR. TRUMBOWER IS ESPECIALLY FITTED FOR HIS NEW POSITION BY PREVIOUS EXPERIENCE AND TRAINING. FROM 1910 TO 1916 HE WAS A MEMBER OF THE ECONOMICS DEPARTMENT OF THE UNIVERSITY OF WISCONSIN AND RESIGNED THIS POSITION TO BECOME A MEMBER OF THE RAILROAD COMMISSION OF WISCONSIN, A POST WHICH HE HELD FOR 7 YEARS. HIS RECORD IN THIS WORK ATTRACTED THE ATTENTION OF THE BUREAU AND HE BECAME A MEMBER OF OUR STAFF ON MAY 1, 1923.

IN THE THREE-YEAR PERIOD DURING WHICH MR. TRUMBOWER HAS BEEN CONNECTED WITH THE BUREAU HE HAS CONTRIBUTED TO A CONSIDERABLE DEGREE TO THE DEVELOPMENT OF THE NEW SCIENCE OF HIGHWAY ECONOMICS. HIS RESEARCH STUDIES ON HIGHWAY FINANCE, MOTOR VEHICLE TAXATION, AND THE ECONOMIC USE OF MOTOR VEHICLES ON HIGHWAYS HAVE PROVIDED A BASIS FOR NATIONAL LEGISLATION BY THE SEVERAL STATES. HE IS A PROLIFIC WRITER AND HAS DELIVERED NUMEROUS PAPERS ON HIGHWAY ECONOMICS BEFORE VARIOUS HIGHWAY ORGANIZATIONS AND TESTIFIED TO SEVERAL CONGRESSIONAL COMMITTEES RELATIVE TO FEDERAL HIGHWAY LEGISLATION.

ALTHOUGH MR. TRUMBOWER WILL DEVOTE THE GREATER PORTION OF HIS TIME TO THE UNIVERSITY OF WISCONSIN HE WILL NOT SEVER HIS CONNECTION ENTIRELY WITH THE BUREAU BUT PLANS TO CONTINUE HIS HIGHWAY RESEARCH ACTIVITIES AND REMAIN CHAIRMAN OF THE HIGHWAY FINANCE COMMITTEE OF THE HIGHWAY RESEARCH BOARD. AT THE PRESENT TIME HE IS ENGAGED IN PREPARING A REPORT FOR THE SIXTH ANNUAL MEETING OF THE HIGHWAY RESEARCH BOARD RELATIVE TO THE "DISPOSITION OF MOTOR VEHICLE REVENUES BY THE VARIOUS STATES."

MR. TRUMBOWER'S CONGENIAL PERSONALITY HAS WON FOR HIM A HOST OF FRIENDS IN THE BUREAU WHO ARE SORRY TO SEE HIM LEAVE BUT WHO WISH FOR HIM THE BEST OF SUCCESS IN HIS NEW APPOINTMENT.

TABULATED HISTORY OF GASOLINE TAX RATES BY STATES

CONTRIBUTED BY H. R. TRUMBOWER, ECONOMIST.

STATE	: FIRST GASOLINE		: FIRST INCREASE		: SECOND INCREASE	
	: TAX		: OF GASOLINE TAX		: OF GASOLINE TAX	
	: DATE		: DATE		: DATE	
	: AMOUNT	: EFFECTIVE	: AMOUNT	: EFFECTIVE	: AMOUNT	: EFFECTIVE
	: CENTS	:	: CENTS	:	: CENTS	:
ALABAMA	: 2	: 3-1-23	:	:	:	:
ARIZONA	: 1	: 6-9-21	: 3	: 6-9-23	:	:
ARKANSAS	: 1	: 4-1-21	: 3	: 4-1-23	: 4	: 1-31-24
CALIFORNIA	: 2	: 9-30-23	:	:	:	:
COLORADO	: 1	: 4-9-19	: 2	: 8-1-23	:	:
CONNECTICUT	: 1	: 9-1-21	: 2	: 7-1-25	:	:
DELAWARE	: 1	: 4-22-23	: 2	: 1-1-24	:	:
FLORIDA	: 1	: 6-20-21	: 3	: 7-1-23	: 4	: 6-6-25
GEORGIA	: 1	: 8-10-21	: 3	: 10-1-23	: 3 $\frac{1}{2}$: 8-26-25
IDAHO	: 2	: 4-1-23	: 3	: 3-1-25	:	:
ILLINOIS	: -	: -	: -	: -	: -	: -
INDIANA	: 2	: 6-1-23	: 3	: 4-1-25	:	:
IOWA	: 2	: 4-16-25	:	:	:	:
KANSAS	: 2	: 5-1-25	:	:	:	:
KENTUCKY	: 1	: 6-21-20	: 3	: 6-19-24	: 5	: 2-21-26
LOUISIANA	: 1	: 12-9-21	: 2	: 8-1-24	:	:
MAINE	: 1	: 7-7-23	: 3	: 7-11-25	:	:
MARYLAND	: 1	: 6-1-22	: 2	: 1-1-24	:	:
MASSACHUSETTS	: -	: -	: -	: -	: -	: -
MICHIGAN	: 2	: 2-1-25	:	:	:	:
MINNESOTA	: 2	: 5-1-25	:	:	:	:
MISSISSIPPI	: 1	: 3-25-22	: 3	: 5-9-24	: 4	: 4-1-26
MISSOURI	: 2	: 1-1-25	:	:	:	:
MONTANA	: 1	: 3-5-21	: 2	: 4-1-23	:	:
NEBRASKA	: 2	: 4-1-25	:	:	:	:
NEVADA	: 2	: 3-20-23	: 4	: 4-1-25	:	:
NEW HAMPSHIRE	: 1	: 7-1-23	: 2	: 1-1-24	:	:
NEW JERSEY	: -	: -	: -	: -	: -	: -
NEW MEXICO	: 2	: 3-17-19	: 1	: 3-12-21	: 3	: 3-17-25
NEW YORK	: -	: -	: -	: -	: -	: -
NORTH CAROLINA	: 1	: 3-3-21	: 3	: 4-1-23	: 4	: 2-21-25
NORTH DAKOTA	: 1 $\frac{1}{4}$: 3-6-19	: 1	: 3-6-23	:	:
OHIO	: 2	: 4-18-25	:	:	:	:
OKLAHOMA	: 1	: 7-1-23	: 2 $\frac{1}{2}$: 3-8-24	: 3	: 3-23-25
OREGON	: 1	: 2-25-19	: 2	: 3-1-21	: 3	: 5-24-23

STATE	: FIRST GASOLINE		: FIRST INCREASE		: SECOND INCREASE	
	: TAX		: OF GASOLINE TAX		: OF GASOLINE TAX	
	: :		: DATE		: DATE	
	: AMOUNT	: EFFECTIVE	: AMOUNT	: EFFECTIVE	: AMOUNT	: EFFECTIVE
	: CENTS	:	: CENTS	:	: CENTS	:
PENNSYLVANIA	: 1	: 9-1-21	: 2	: 7-1-23	:	:
RHODE ISLAND	: 1	: 5-30-25	:	:	:	:
SOUTH CAROLINA	: 2	: 3-1-22	: 3	: 3-23-23	: 5	: 3-23-25
SOUTH DAKOTA	: 1	: 1-1-22	: 2	: 7-1-23	: 3	: 3-10-25
TENNESSEE	: 2	: 4-1-23	: 3	: 2-9-25	:	:
TEXAS	: 1	: 6-15-23	:	:	:	:
UTAH	: 2½	: 3-8-23	: 3½	: 4-1-25	:	:
VERMONT	: 1	: 4-1-23	: 2	: 2-26-25	:	:
VIRGINIA	: 3	: 6-27-23	: 4½	: 3-12-26	:	:
WASHINGTON	: 1	: 7-1-21	: 2	: 1-1-24	:	:
WEST VIRGINIA	: 2	: 7-27-23	: 3½	: 7-1-25	:	:
WISCONSIN	: 1	: 4-1-25	:	:	:	:
WYOMING	: 1	: 4-1-23	: 2½	: 4-1-25	:	:
DIST. OF COLUMBIA	: 2	: 5-23-24	:	:	:	:

NATIONAL PARKS ROADS MOTION PICTURE IN PREPARATION

THE OFFICE OF MOTION PICTURES OF THE DEPARTMENT AT THE REQUEST OF THE BUREAU HAS BEGUN FIELD WORK ON A FILM OF THE ROAD WORK IN THE NATIONAL PARKS. MESSRS. PERKINS AND GOERGENS ARRIVED IN DENVER ON JULY 12 TO TAKE THE FIRST VIEWS IN THE ROCKY MOUNTAIN NATIONAL PARK. THEIR LATER ITINERARY INCLUDES GLACIER NATIONAL PARK IN MONTANA, MOUNT RANIER NATIONAL PARK IN WASHINGTON, AND YOSEMITE NATIONAL PARK IN CALIFORNIA. THIS INITIAL TRIP IS EXPECTED TO END THE FIRST WEEK IN AUGUST.

THE SUBJECT MATTER WILL INCLUDE THE BOLD AND ROMANTIC CONSTRUCTION WORK IN PROGRESS IN GLACIER COUPLED WITH THE DIFFICULT AND HAZARDOUS WORK OF THE HIGHWAY ENGINEERS IN MAKING THE SURVEYS AND THE VIGOROUS OUTDOOR CAMP LIFE. IN THE OTHER PARKS THE SCENIC ATTRACTIONS AND THE TOURISTS HOTELS AND CAMPS MADE ACCESSIBLE BY THESE ROADS MAY BE FEATURED.

THE TIME ELEMENT AS A FACTOR IN COMPARING BIDS
AND AWARDING CONTRACTS

CONTRIBUTED BY THE LEGAL SECTION.

THERE RECENTLY HAVE COME UP FOR CONSIDERATION DRAFTS OF PROPOSED SPECIAL PROVISIONS SUBMITTED BY TWO STATES FOR INCLUSION IN THEIR SPECIFICATIONS FOR USE ON FEDERAL-AID PROJECTS, PROVIDING FOR A DAILY ENGINEERING CHARGE OF A SPECIFIED AMOUNT TO BE DEBITED AND CREDITED TO EACH BIDDER FOR EACH DAY OF TIME WITHIN WHICH HE SPECIFIED THAT HE WOULD COMPLETE THE CONTRACT. THE PURPOSE OF THE PROVISION IS TO MAKE THE TIME ELEMENT A FACTOR IN THE COMPARISON OF BIDS AND AWARD OF CONTRACTS. THIS PROVISION, AS SUBMITTED BY ONE STATE, WOULD PERMIT THE BIDDERS TO NAME NOT ONLY THE TIME WITHIN WHICH THEY WOULD COMPLETE THE WORK BUT ALSO THE DAILY ENGINEERING CHARGE TO BE DEBITED AND CREDITED TO EACH BID; AND ANOTHER PROPOSED THAT THE CONTRACTOR SHOULD SPECIFY THE TIME WITHIN WHICH HE WOULD COMPLETE THE WORK AND THE STATE SHOULD FIX THE DAILY ENGINEERING CHARGE TO BE DEBITED AND CREDITED. THESE PROPOSED PROVISIONS, OF COURSE, WOULD BE IN LIEU OF THE USUAL LIQUIDATED-DAMAGE CLAUSES.

THESE SPECIAL PROVISIONS WOULD HAVE THE EFFECT OF YIELDING A BONUS TO CONTRACTORS IN THE CASE OF PROJECTS WHICH THEY MIGHT COMPLETE IN A SHORTER TIME THAN THAT SPECIFIED IN THEIR BIDS, OR OF PENALIZING THEM IN CASES WHERE THEY MAY REQUIRE A LONGER TIME FOR COMPLETING THE WORK THAN THAT SPECIFIED IN THE BIDS. WHERE CONTRACTORS ARE PERMITTED TO NAME ONE OR BOTH OF THESE FACTORS, THEY CAN NOT BE SAID TO BID ON THE SAME BASIS, UNLESS THEY SHOULD BY CHANCE NAME BOTH FACTORS ALIKE, AND THE USE OF A PROVISION OF THIS KIND VERY EASILY CAN BE UTILIZED TO MAKE AWARD TO OTHER THAN THE LOW BIDDER ON THE ITEMS OF WORK TO BE PERFORMED, AS ACTUALLY WAS THE CASE ON ONE PROJECT SUBMITTED. AFTER CAREFUL CONSIDERATION OF THE PROPOSED PROVISIONS, THEREFORE, IT WAS CONCLUDED THAT IF THESE OR SIMILAR PROVISIONS SHOULD BE USED AT ALL THE STATE SHOULD NAME THE TIME OF COMPLETION AND ALSO THE DAILY ENGINEERING CHARGE TO BE DEBITED AND CREDITED IN ORDER THAT ALL CONTRACTORS MAY BID ON THE SAME BASIS. IT ALSO WAS CONCLUDED THAT IF THE CONTRACTOR SHOULD FAIL TO COMPLETE THE WORK WITHIN THE TIME SPECIFIED, PLUS ANY AUTHORIZED EXTENSION THEREOF, IF ANY, THERE SHOULD BE DEDUCTED FOR EACH DAY OF SUCH OVERRUN IN TIME THE DAILY ENGINEERING CHARGE PREVIOUSLY DEBITED AND CREDITED. THE ESTIMATE SUBMITTED AS THE BASIS FOR FEDERAL-AID PAYMENTS SHOULD ALSO BE REDUCED BY THE AMOUNT OF SUCH DEDUCTION, SO THAT THE AMOUNT TO BE PAID BY THE FEDERAL GOVERNMENT AND THE STATE WILL BE CURTAILED ACCORDINGLY. IT WAS CONCLUDED ALSO THAT THE BUREAU CAN NOT PARTICIPATE, EITHER DIRECT OR INDIRECTLY, IN ANY PART OF A BONUS TO A CONTRACTOR FOR COMPLETING WORK IN ADVANCE OF THE TIME SPECIFIED.

METHOD OF FORMING GROOVED LONGITUDINAL JOINTS IN CALIFORNIA CONCRETE PAVEMENTS

CONTRIBUTED BY THE DIVISION OF CONSTRUCTION

COMPILED FROM A REPORT SUBMITTED BY JOHN D. SHAW,
HIGHWAY ENGINEER OF DISTRICT 2.

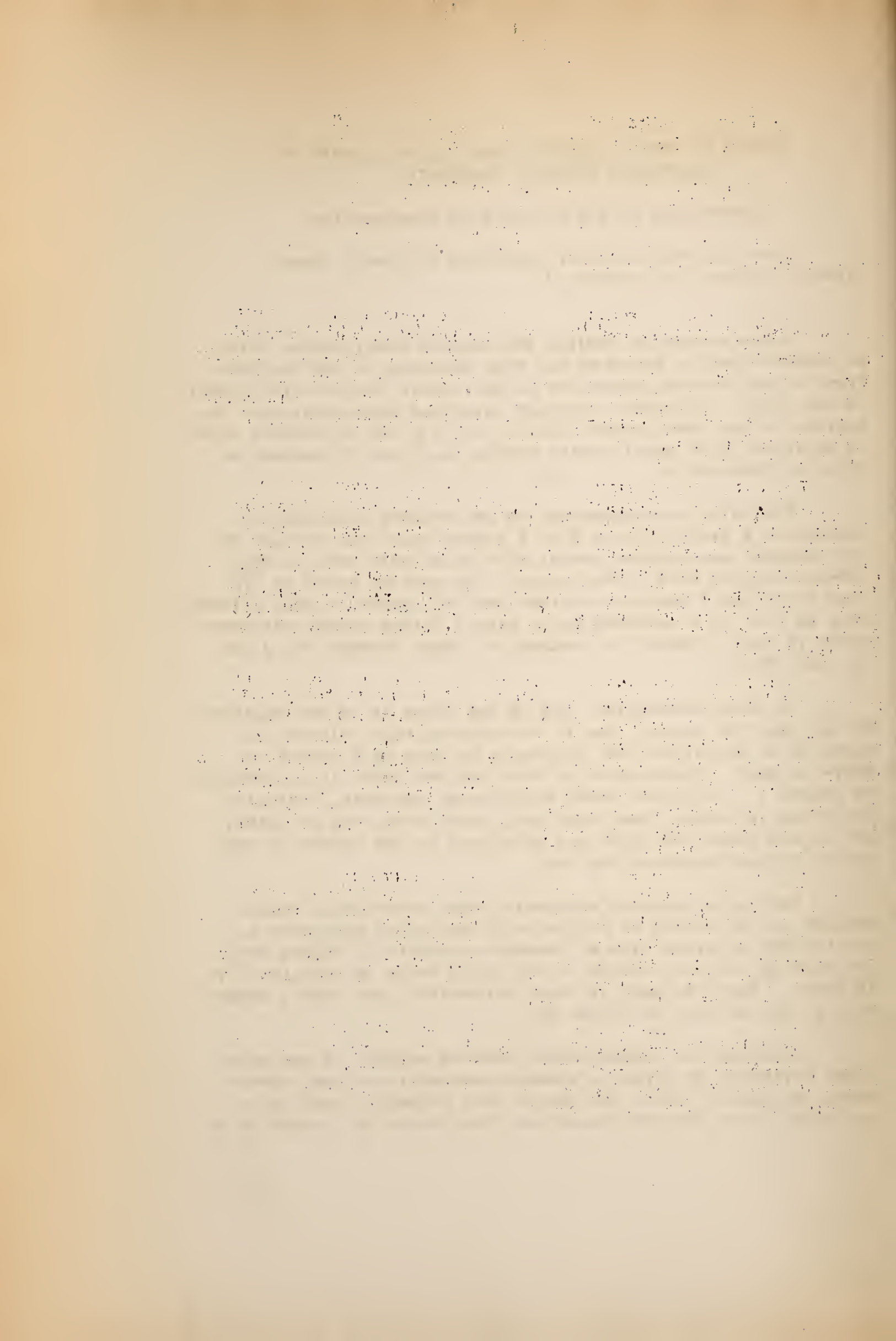
A NEW METHOD OF FORMING THE GROOVED LONGITUDINAL JOINT OR CENTER PLANE OF WEAKNESS HAS BEEN EMPLOYED IN THE CONSTRUCTION OF THE CONCRETE PAVEMENTS ON CALIFORNIA FEDERAL-AID PROJECTS 2A AND 136B. ALTHOUGH A SIMILAR JOINT HAS BEEN PREVIOUSLY DESCRIBED IN THE NEWS LETTER (VOL. 1, No. 1), THE CALIFORNIA JOINT IS BELIEVED TO BE SUFFICIENTLY SIMPLE AND NOVEL TO WARRANT A DETAILED DESCRIPTION.

THE JOINT IS CONSTRUCTED IN THE THICKER PAVEMENTS BY SUBMERGING A PARTING STRIP 3 TO 4 INCHES BELOW THE SURFACE OF THE CONCRETE AND FORMING IMMEDIATELY ABOVE THIS STRIP A DEEP V-SHAPED GROOVE WITH A WIDE ANGLE. THE PARTING STRIP IS $1/2$ INCH THICK AND 5 INCHES IN HEIGHT AND THE GROOVE IS MADE 2 INCHES DEEP SO THAT IN A PAVEMENT BUILT WITH A 9-INCH CENTER THICKNESS THERE IS ONLY 2 INCHES OF CONCRETE TO BREAK BETWEEN THE JOINT AND THE STRIP.

ON THIN RESURFACING JOBS IN THE STATE IT IS THE PRACTICE TO USE ONLY THE GROOVE, AND IT IS POSSIBLE THAT THIS MAY BE FOUND TO BE SUFFICIENT FOR PAVEMENTS AS MUCH AS 6 INCHES IN DEPTH OR MORE. CONSTRUCTED IN THIS WAY THE JOINT IS ILLUSTRATED IN FIGURE 1. AT LEAST THREE RESURFACING PROJECTS, TOTALLING TEN MILES IN LENGTH, HAVE BEEN BUILT WITH THIS TYPE OF JOINT, AND IN ALL CASES THE CRACK HAS DEVELOPED AT THE BOTTOM OF THE GROOVE WITHOUT SPALLING THE TOP.

THE TOOLS REQUIRED FOR MAKING THE LONGITUDINAL GROOVE CONSIST OF TWO PIECES OF 2-INCH BY 6-INCH PLANK SHOD WITH A METAL PLATE PROVIDED WITH A V-SHAPED PROJECTION 2 INCHES DEEP AND RUNNING THE FULL LENGTH OF THE BOARD WHICH IS USUALLY 10 TO 12 FEET. THE V IS MADE OF HEAVY GALVANIZED IRON OVER A WOODEN CORE AS MAY BE SEEN IN FIGURE 2A.

IN USING THE LAKEWOOD-TYPE TAMPING MACHINE IT HAS BEEN FOUND ADVISABLE TO ATTACH A V-SHAPED PROJECTION TO THE TAMPER BOARD IN ORDER TO FORCE THE LARGER ROCK FRAGMENTS DOWN ON TO ONE SIDE OF THE PROPOSED GROOVE AND THUS ALLOW THE GROOVE TO BE



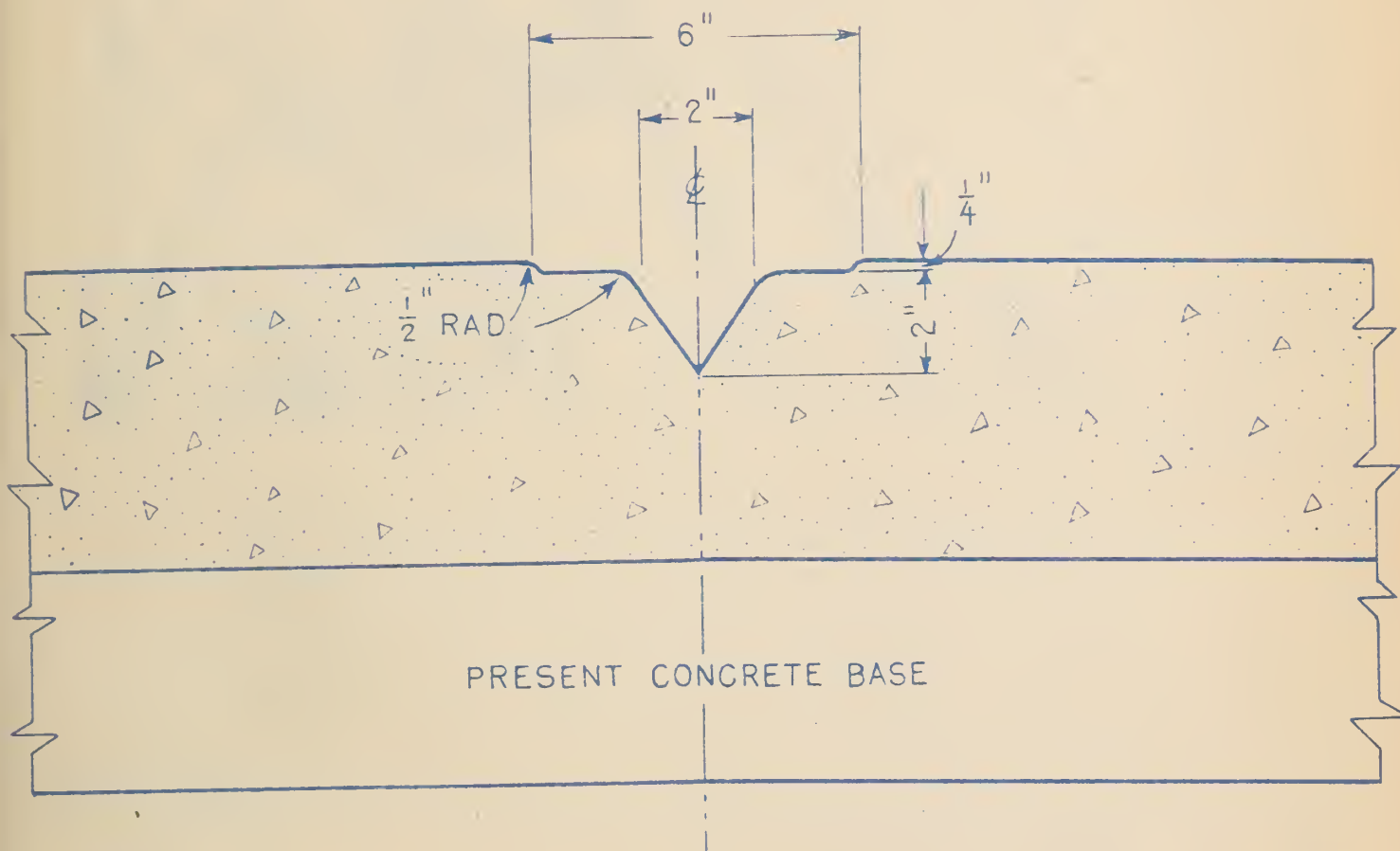


FIG. 1 - THE LONGITUDINAL GROOVE WITHOUT THE PARTING STRIP HAS BEEN USED SUCCESSFULLY ON RESURFACING JOBS.



FIG. 2A - CENTER-LINE GROOVE TAMPER MOUNTED ON A 2 INCH X 6 INCH X 12 FOOT PLANK. BOTH ENDS OF THE TOOL ARE CONSTRUCTED IDENTICALLY THE SAME.

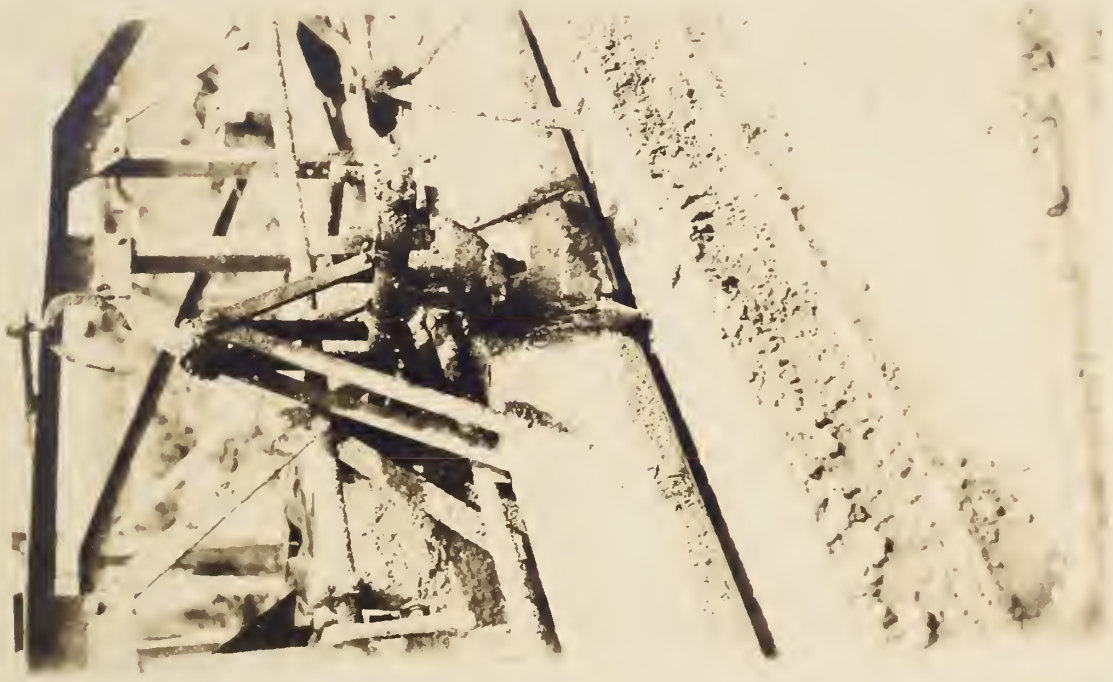
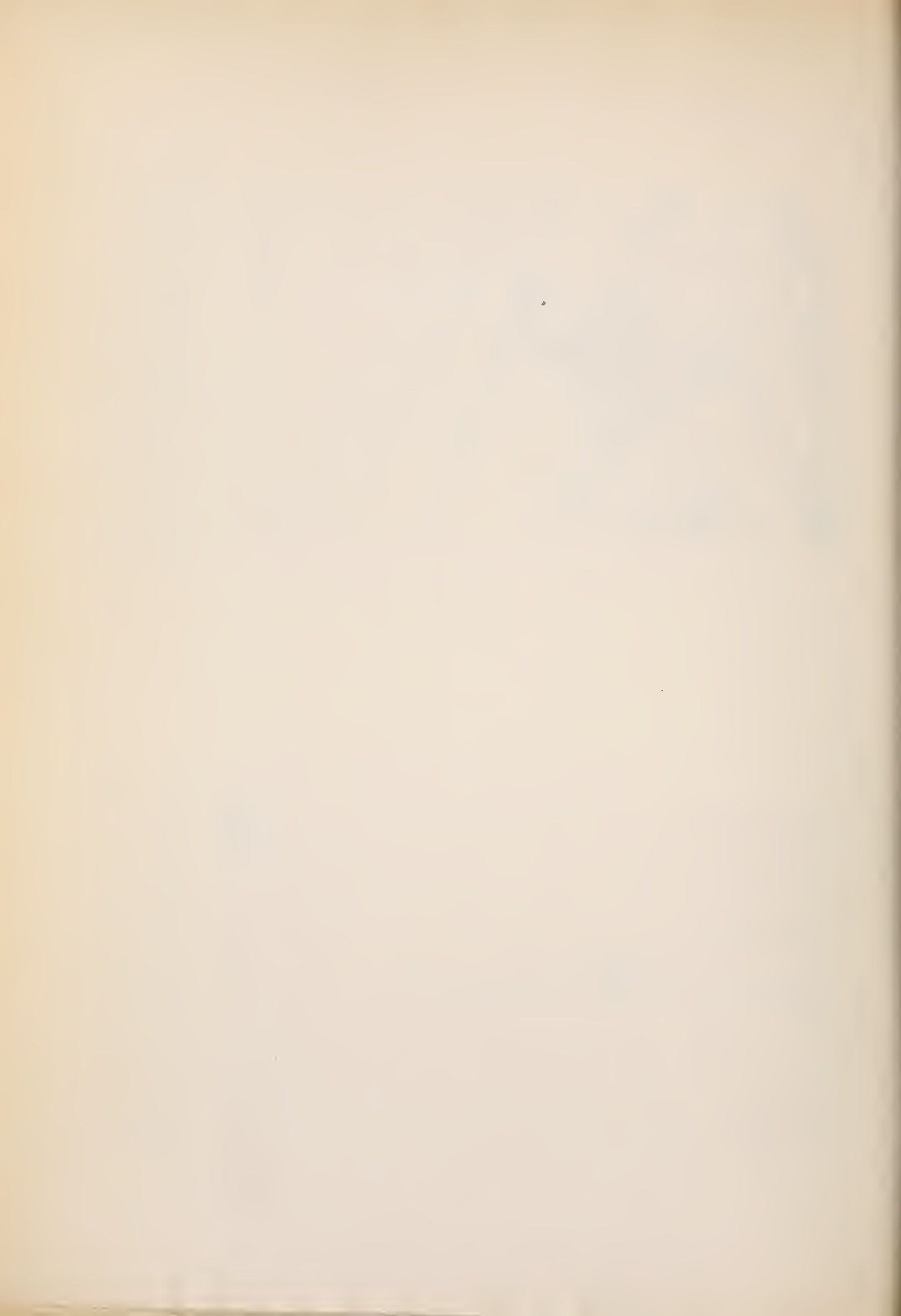


FIG. 2B - THE V-PROJECTION ON THE TAMPING BOARD OF THE LAKEWOOD MACHINE FORCES THE LARGE ROCKS AWAY FROM THE GROOVE SO AS NOT TO INTERFERE WITH THE CENTER-LINE GROOVING TOOL SHOWN IN FIG. 2A.



FINALLY IMPRESSED WITH THE MINIMUM OF INTERFERENCE FROM THE COARSE AGGREGATE. (FIGURE 2B). IN THE ORD TYPE OF FINISHING MACHINE A 2-INCH SQUARE STEEL BAR IS ATTACHED TO THE REAR SCREED AT THE PROPER ELEVATION. AFTER THE TAMPING THE CONCRETE IS COMPLETELY REFINISHED AND THE SQUARE GROOVE IS REFILLED WITH MORTAR WHICH OFFERS ONLY SLIGHT RESISTANCE TO THE FINAL IMPRESSION OF THE V-GROOVE.

IN ALL CASES AFTER THE PAVEMENT HAS BEEN FINISHED TO FULL WIDTH, THE CENTER LINE IS SCRATCHED AT INTERVALS WITH A NAIL ON A STICK GUIDED BY THE SIDE FORMS. A CHALK LINE IS THEN STRETCHED ANY DESIRED DISTANCE ALONG THE CENTER AND SNAPPED INTO THE SOFT CONCRETE. THE GROOVER IS THEN CENTERED ON THE MARKED LINE AND PRESSED INTO THE SOFT CONCRETE BY A MAN'S WEIGHT ASSISTED BY LIGHT TAMPING WITH A HAMMER OR PICK (FIGURE 3). THE IMPRESSION IN THE PAVEMENT IS THEN SMOOTHED AND FINISHED WITH A SPECIALLY CONSTRUCTED FINISHING TOOL PROVIDED WITH A LONG HANDLE FOR OPERATING FROM A BRIDGE (FIGURES 4A AND 4B).

FIGURE 5 SHOWS THE COMPLETED GROOVE. IN ADDITION TO PROVIDING A LONGITUDINAL JOINT THE GROOVER FURNISHES A GUIDE FOR PAINTING THE CENTER TRAFFIC LINE ON NEW PAVEMENTS. THIS GROOVE PROVIDES AN EFFECTIVE LONGITUDINAL JOINT WHICH IS PLEASING TO THE EYE AND MAY BE FORMED WITHOUT DIFFICULTY. THE TOOLS ARE INEXPENSIVE AND ONLY A MODERATE AMOUNT OF LABOR IS REQUIRED. FOR ONE PROJECT THE COMPLETED GROOVE AVERAGED $3\frac{1}{2}$ CENTS PER LINEAL FOOT OF PAVEMENT.



FIG. 3 - CENTERING THE V-GROOVE TAMPER ON THE LINE SNAPPED INTO THE SOFT CONCRETE WITH A CHALK LINE.



FIG. 4A - THE FINISHING TOOL MACHINED FROM A HARD WHITE-METAL CASTING COST \$32.00. THE TOOL IS ROUNDED SLIGHTLY LONGITUDINALLY TO AVOID DIGGING INTO THE CONCRETE.

4B - THE FINISHING TOOL IS OPERATED FROM A BRIDGE. THE PAVEMENT HAS BEEN PREVIOUSLY EDGED WITH A $\frac{1}{2}$ -INCH RADIUS WALKING EDGER WITH A 6-INCH BLADE. THE BURLAP WILL BE PLACED AFTER THE CENTER GROOVE IS FINISHED.



FIG. 5 - CLOSE-UP OF FINISHED LONGITUDINAL-GROOVED JOINTS.

MISSOURI DESIGNS CORE DRILL FOR CONCRETE PAVEMENTS

CONTRIBUTED BY THE DIVISION OF CONSTRUCTION

COMPILED FROM A REPORT SUBMITTED BY THOMAS J. LOUGH,
ASSOCIATE HIGHWAY ENGINEER OF DISTRICT 5.

A MACHINE FOR DRILLING CORES FROM CONCRETE PAVEMENTS HAS BEEN DESIGNED AND CONSTRUCTED BY THE MISSOURI STATE HIGHWAY COMMISSION IN ITS OWN SHOPS UNDER THE IMMEDIATE SUPERVISION OF THE DIVISION OF MATERIALS. FIVE UNITS OF THE APPARATUS ARE NOW IN OPERATION. EACH OUTFIT WEIGHS 900 POUNDS WITH THE WATER TANK EMPTY AND THE COMPLETED COST IS APPROXIMATELY \$300.00.

THE OUTFIT CONSISTS OF THE DRILLING UNIT, GASOLINE ENGINE AND WATER TANK, AND MINOR PARTS, ALL MOUNTED ON A RUBBER-TIRED TRAILER. THE APPARATUS IS LIGHT ENOUGH TO BE TRANSPORTED EASILY BY A FORD AUTOMOBILE. THE CORE DRILL IS OF THE ORDINARY SHOT TYPE AND IS CAPABLE OF CUTTING A $4\frac{1}{2}$ -INCH CORE FROM A 6-INCH PAVEMENT IN FROM FIFTEEN TO TWENTY-FIVE MINUTES. THE TIME REQUIRED DEPENDS ON THE NATURE OF THE COARSE AGGREGATE - CRUSHED LIMESTONE DEMANDING THE LEAST AND FLINT GRAVEL REQUIRING THE GREATEST TIME.

FIG. 1-A SHOWS THE CORE DRILL AS ORIGINALLY CONSTRUCTED. THIS HAS BEEN IN OPERATION SOME FEW MONTHS WITH GRATIFYING RESULTS. THE OUTFITS CONSTRUCTED SUBSEQUENTLY WERE IDENTICAL WITH THE EXCEPTION OF A FEW MINOR ALTERATIONS.

ALTHOUGH DRILLING OPERATIONS MAY BE PERFORMED BY ONE MAN, THE DEPARTMENT HAS FOUND IT ADVANTAGEOUS TO FURNISH A LOW-SALARIED HELPER TO EXPEDITE THE WORK. THIS ASSISTANT DETERMINES THE LOCATIONS OF THE CORES, MEASURES AND LABELS THE CORES, MIXES CONCRETE AND REFILLS THE HOLES, TOGETHER WITH OTHER MISCELLANEOUS WORK. THE CORE HOLES ARE FILLED WITH LUMNITE-CEMENT CONCRETE OF THE SAME PROPORTIONS AS THE PAVEMENT. THE CEMENT, FINE, AND COARSE AGGREGATES ARE CARRIED IN THE REAR OF THE FORD COUPE WHICH TOWS THE OUTFIT.

THE HIGHWAY DEPARTMENT INTENDS TO FOLLOW UP PAVEMENT CONSTRUCTION OPERATIONS AND USE THE OUTFIT FOR TAKING CORES WHEN THE CONCRETE IS 28 DAYS OLD. IN THIS WAY ANY DEFICIENCY IN SLAB THICKNESS MAY BE DETECTED AND THE REASONS THEREFOR DETERMINED, IN ORDER THAT APPROPRIATE STEPS MAY BE TAKEN TO AVOID RECURRENCES OF THE SAME DEFECTS. THE OUTFIT IS LIGHT ENOUGH, EVEN TO PERMIT



FIG. 1A - THE RATE OF PENETRATION OF THE DRILL IS GOVERNED BY VARYING THE PRESSURE ON THE HAND LEVER.

1B - COMPLETE DRILLING OUTFIT PACKED IN READINESS FOR REMOVAL WITH A FORD COUPE.

OF CORE DRILLING ON A PAVEMENT FROM ONE TO TWO WEEKS OLD, IF NECESSARY, WITHOUT DAMAGE TO THE CONCRETE.

THE ESSENTIAL FEATURES OF THE DRILL CONSIST OF THE SCREW FEED AND THE TYPE OF BIT. THE SCREW FEED HAS A FRICTION CONTROL. THE RATE OF PROGRESS OF THE BIT THROUGH THE PAVEMENT IS GOVERNED BY VARYING THE PRESSURE ON A HAND LEVER WHICH CONTROLS THE FRICTION CLUTCH. THIS FEED-CONTROL UNIT IS THE FEATURE FOR WHICH A PATENT IS TO BE APPLIED FOR.

THE BIT IS CONSTRUCTED FROM A 27-INCH LENGTH OF EXTRA-HEAVY STANDARD 5-INCH GAS PIPE THREADED AT THE UPPER END AND WITH A 2 INCH BY $\frac{1}{2}$ INCH SLOT IN THE BOTTOM EDGE AS IN THE ORDINARY SHOT DRILL. THE ABRASIVE - NO. $2\frac{1}{2}$ CHILLED STEEL SHOT - PASSES DOWN THE SLOT TO THE CUTTING EDGE OF THE BIT. AS WEAR OF THE CUTTING EDGE REDUCES THE LENGTH OF THE SLOT IT MUST BE PROGRESSIVELY EXTENDED. THIS IS ACCOMPLISHED READILY IN THE FIELD BY MEANS OF A HACK SAW AND COLD CHISEL.

THE LIFE OF THE BIT DEPENDS, OF COURSE, UPON THE HARDNESS OF THE CONCRETE AGGREGATE. ONE BIT WILL CUT APPROXIMATELY 400 CORES FROM A 6-INCH PAVEMENT IN WHICH THE COARSE AGGREGATE IS CRUSHED LIMESTONE; WHEREAS REPLACEMENT IS NECESSARY AFTER 200 CORES ARE DRILLED FROM A FLINT GRAVEL CONCRETE. SEAMLESS STEEL TUBING WAS TRIED IN THE CONSTRUCTION OF SOME OF THE BITS BUT THE USE OF THIS MATERIAL HAS BEEN ABANDONED IN FAVOR OF ORDINARY GAS PIPE. THE LATTER HAS PROVEN EQUALLY DURABLE, IS MUCH CHEAPER, AND SEEMS TO PRODUCE A SMOOTHER CORE.

THE PRINCIPAL ADVANTAGES OF THIS DESIGN OF CORE DRILL ARE LOW FIRST COST AND OPERATING EXPENSE; LIGHT WEIGHT, WHICH MAKES TRANSPORTATION EASY AND MAKES POSSIBLE THE CORING OF PAVEMENTS AT AN EARLY AGE; AND, THE MINIMUM OBSTRUCTION TO TRAFFIC WHICH IT OFFERS.

THE FIRST PART OF THE HISTORY OF THE
REIGN OF HENRY THE SECOND
BY JOHN GILBERT FROTHINGHAM
ESQ.
OF THE BARR

THE SECOND PART OF THE HISTORY OF THE
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THE THIRD PART OF THE HISTORY OF THE
REIGN OF HENRY THE SECOND
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THE FOURTH PART OF THE HISTORY OF THE
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BORING MACHINE USED PREPARATORY TO SINKING CONCRETE PILES

CONTRIBUTED BY THE DIVISION OF CONSTRUCTION

COMPILED FROM A REPORT SUBMITTED BY A. V. WILLIAMSON,
HIGHWAY ENGINEER OF DISTRICT 3.

A SPECIALLY DESIGNED BORING MACHINE WAS USED FOR DRILLING HOLES THROUGH A LAYER OF INTERMINGLED SAND AND SLAG, PREPARATORY TO THE DRIVING OF CONCRETE PILES FOR A 400-FOOT TRESTLE ON COLORADO FEDERAL-AID PROJECT 287-A. THE IMPROVEMENT CONSISTED OF THE ERECTION OF THE TRESTLE WITH PRE-MOLDED CONCRETE PILING OVER BIJOU CREEK AT A POINT 100 FEET DOWN STREAM FROM THE CHICAGO, BURLINGTON AND QUINCY RAILROAD BRIDGE. PREVIOUSLY THE RAILROAD COMPANY, IN ORDER TO PROTECT THE FOOTINGS OF THE BRIDGE FROM SCOURING, HAD DUMPED CONSIDERABLE QUANTITIES OF LOOSE SLAG AROUND THE ABUTMENTS AND THIS MATERIAL HAD BEEN CARRIED DOWNSTREAM BY HEAVY FLOODS AND MIXED TO A DEPTH OF 4 TO 14 FEET WITH THE SANDY BED OF THE STREAM AT THE SITE OF THE PROPOSED FEDERAL-AID TRESTLE.

SEVERAL ATTEMPTS TO DRIVE CONCRETE PILES THROUGH THIS ACCUMULATION OF SLAG WERE UNSUCCESSFUL. ALTHOUGH THE CONTRACTOR USED A MCKIERNAN-TERRY No. 9 B-2 STEAM HAMMER WEIGHING COMPLETELY APPROXIMATELY 8200 POUNDS, NO SATISFACTORY PROGRESS COULD BE MADE BY STRAIGHT DRIVING.

HAVING RECOGNIZED THE FUTILITY OF STRAIGHT DRIVING, AN ATTEMPT WAS MADE TO SINK THE PILING WITH THE AID OF A WATER JET AND A WELL WAS SUNK NEAR THE SITE OF THE TRESTLE TO FURNISH THE WATER SUPPLY. THIS METHOD SEPARATED THE SAND FROM THE SLAG TO A CERTAIN DEPTH AND THE PILING PENETRATED UNTIL THE HEAVIER PARTICLES OF SLAG WHICH HAD BEEN GRADUALLY ACCUMULATING UNDER THE PILING FORMED SUCH A THICK MAT THAT THEY RESISTED ANY FURTHER PENETRATION OF THE PILING. LATER THE CONTRACTOR WAS PERMITTED TO DIG HOLES BELOW THE LEVEL OF THE SLAG-SAND MIXTURE AND THEN THE PILING WAS DRIVEN WITH THE HAMMER FOR THE REMAINING 10 OR 12 FEET AND MATERIAL WAS PUDDLED WITH THE WATER JET INTO THE HOLE SURROUNDING THE UPPER PORTION OF THE PILE. BOTH OF THESE METHODS, HOWEVER, PROVED UNSATISFACTORY AND THE CONTRACTOR, THEREFORE, DECIDED TO TAKE RECOURSE TO A LARGE AUGER OR BORING MACHINE TO PENETRATE THE SAND-SLAG LAYER PREPARATORY TO DRIVING THE PILE.

THE BUCKET OR BOWL OF THE AUGER WAS CYLINDRICAL IN SHAPE WITH WALLS OF 1/4-INCH STEEL 30 INCHES HIGH AND 22 INCHES IN DIAMETER. AT ITS BASE THE CYLINDER WAS EQUIPPED WITH CURVED CUTTING BLADES SIMILAR TO AN ORDINARY POST-HOLE AUGER (FIGURE 1A). THE AUGER WAS FASTENED TO THE END OF A 2-7/8 INCH BY 20-FOOT STEEL SHAFT WHICH WAS SLOTTED WITH A KEY WAY FOR ITS ENTIRE LENGTH. THIS KEY WAY ENGAGED A KEY IN THE GEAR DRIVE WHEEL WHICH WAS MOUNTED ON THE SHAFT AND THROUGH WHICH THE SHAFT WAS RAISED OR LOWERED AS THE AUGER WAS PUSHED INTO OR WITHDRAWN FROM THE HOLE. THE DRIVE POWER WAS FURNISHED BY THE DRUM OF A STEAM SHOVEL AS WAS THE POWER FOR ELEVATING OR LOWERING THE SHAFT BY A CABLE FASTENED AT ITS TOP. AS THE SHAFT WAS TURNED, THE WEIGHT OF THE AUGER WAS SUFFICIENT TO SINK IT WITHOUT ANY PARTICULAR DIFFICULTY UNTIL CONSIDERABLE SLAG WAS ENCOUNTERED. THEN IT WAS NECESSARY TO RAISE THE AUGER AND LOOSEN THE SLAG BY MEANS OF BARS AND SHOVELS. A HINGED DOOR IN THE CYLINDRICAL-AUGER BUCKET GREATLY FACILITATED THIS PROCEDURE (FIGURE 1A). THE APPARATUS (FIGURE 1B) WAS DESIGNED BY THE CONTRACTOR, WHO IS AN ENGINEER, AND WAS CONSTRUCTED BY THE ATLAS IRON WORKS OF DENVER.



FIG. 1A - THE CYLINDRICAL BUCKET OF THE AUGER WAS PROVIDED WITH A HINGED DOOR WHICH FACILITATED REMOVAL OF THE SAND-SLAG MIXTURE.

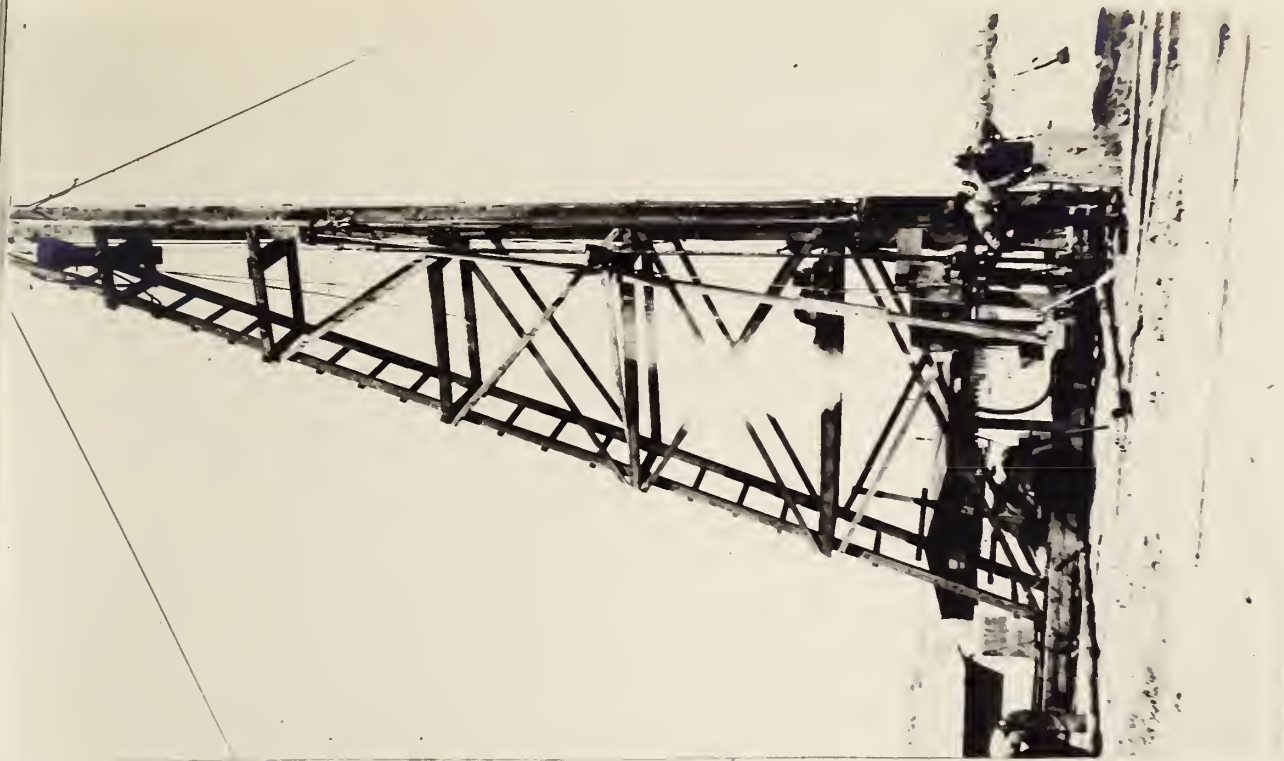


FIG. 1B - THE APPARATUS WAS MOUNTED ON THE END OF A 20-FOOT STEEL SHAFT ATTACHED TO ONE LEG OF THE PILE DRIVER.

